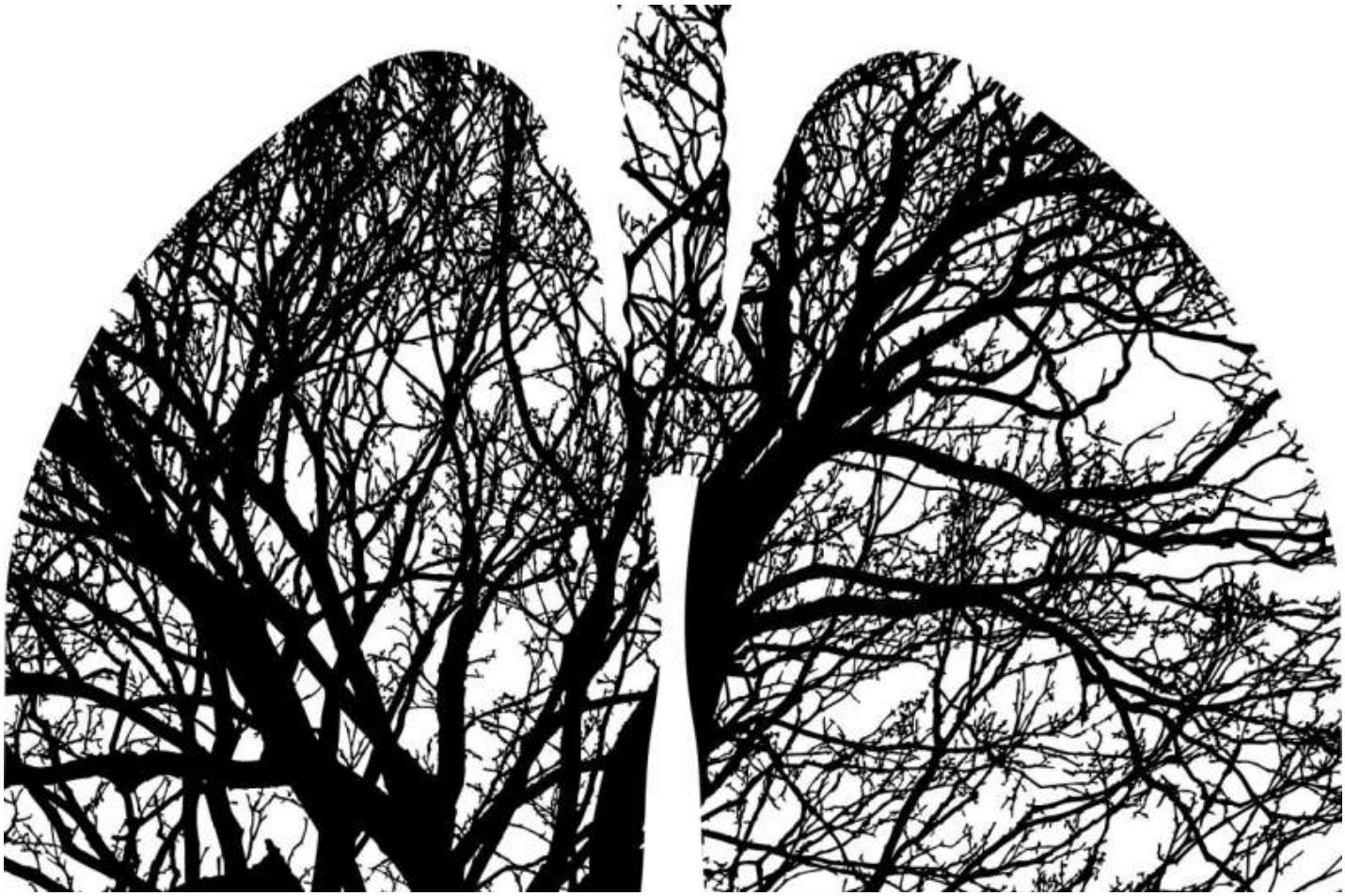
FEBRUARY 3, 2023 Editors' notes

Nano drug delivery breakthrough reveals new possibilities for the treatment of pulmonary fibrosis

by Masonic Medical Research Institute



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A recent breakthrough publication by scientists at the Masonic Medical Research Institute have discovered a novel way of treating pulmonary fibrosis, a progressive incurable disease that results in the stiffening of the lungs through scarring, using nanoparticles.

"While these findings do not yet necessarily cure this disease outright, it shows we have the potential to dramatically impact and improve the quality of life for those affected," said the study's

senior investigator, Jason R. McCarthy, Ph.D., Associate Professor and Science Operations Director at MMRI.

Dr. McCarthy along with 15 collaborators on this project, which include scientists from the MMRI, Massachusetts General Hospital, and Harvard Medical School, embarked upon this study in 2015. Their findings were published earlier this year in the *American Journal of Physiology-Lung Cellular and Molecular Physiology*.

The team focused on the development of nanoparticles capable of targeting fibroblasts in the lung —the cell type responsible for the scarring—in order to deliver an effective drug that halts the progression of the disease.

"The idea behind the study was not to find a novel therapeutic, per se, but to look at whether delivering effective known drugs to specific cells in the lung can have a more potent therapeutic effect," Dr. McCarthy said. "What we showed is that it is indeed possible to target a drug to diseased cells to interrupt the process of cell death and scarring."

Dr. McCarthy and his team are currently investigating whether this strategy could benefit other cell types in the lung as well, elucidating how they function, or malfunction, in the course of idiopathic pulmonary fibrosis. Similarly, they are also expanding their research beyond the lung, to investigate how use of this strategy can work in other organ systems, including the heart and liver.

More information: Rachel S. Knipe et al, Myofibroblast-Specific Inhibition of the Rho Kinase-MRTF-SRF Pathway Using Nanotechnology for the Prevention of Pulmonary Fibrosis, *American Journal of Physiology-Lung Cellular and Molecular Physiology* (2023). DOI: 10.1152/ajplung.00086.2022

Provided by Masonic Medical Research Institute